

What is claimed is:

1. A load port of a semiconductor manufacturing apparatus, comprising:  
a support member having an upper surface, a plurality of kinematic coupling pins protruding from the upper surface of said support member and arrayed to support a wafer cassette loaded onto the support member, and a plurality of sensors that are integrated with said kinematic coupling pins, respectively.

2. The load port of claim 1, wherein the sensors are operable to sense whether a wafer cassette is resting atop of said kinematic coupling pins.

3. The load port of claim 1, wherein said sensors have contacts that are embedded in said kinematic coupling pins, respectively, said contacts each having an upper portions exposed at the top of one of said pins.

4. The load port of claim 1, comprising at least three of said kinematic coupling pins and sensors integrated therewith.

5. The load port of claim 1, wherein said sensors comprise a photo sensor or an on-off switch.

6. The load port of claim 1, wherein said sensors comprise a weight

detector operable to detect a load exerted thereon.

7. The load port of claim 6, wherein said weight detector comprises a piezoelectric element.

8. A loading section of a semiconductor manufacturing apparatus, comprising: a mini-chamber equipped with a robot, a load-lock chamber connected to said mini-chamber, and a load port disposed outside said mini-chamber, said load port including a support member having an upper surface, a plurality of kinematic coupling pins protruding from the upper surface of said support member and arrayed to support a wafer cassette loaded onto the support member, and a plurality of sensors that are integrated with said kinematic coupling pins, respectively.

9. The loading section of a semiconductor manufacturing apparatus as claimed in claim 8, wherein the sensors of said load port are operable to sense whether a wafer cassette is resting on said kinematic coupling pins.

10. The loading section of a semiconductor manufacturing apparatus as claimed in claim 8, wherein said sensors of the load port have contacts that are embedded in said kinematic coupling pins, respectively, said contacts

having upper portions that are exposed at the top of said pins:

11. The loading section of a semiconductor manufacturing apparatus as claimed in claim 8, wherein said load port comprises at least three of said kinematic coupling pins and integrated sensors.

12. The loading section of a semiconductor manufacturing apparatus as claimed in claim 8, wherein said sensors of the load port comprise a photo sensor or an on-off switch.

13. The loading section of a semiconductor manufacturing apparatus as claimed in claim 8, wherein said sensors of the load port comprise a weight detector operable to detect a load exerted thereon.

14. The loading section of a semiconductor manufacturing apparatus as claimed in claim 13, wherein said weight detector comprises a piezoelectric element.

15. A method of loading wafers into a semiconductor manufacturing apparatus, said method comprising :

placing a wafer cassette on a support member of a load port;

measuring the load exerted by the cassette on the support member, and determining whether the bottom of the cassette is present at a plurality of spaced-apart sites above the support member;

comparing the measured load to a predetermined value;

issuing a control signal only if the bottom of the cassette is determined to be present at each of said sites, and the measured load exceeds said predetermined value; and

commanding a robot to transfer wafers from the cassette into a chamber of the manufacturing apparatus in response to the issuing of the command signal.

16. The method of loading wafers as claimed in 15, wherein said measuring of the load comprises measuring the loads exerted by the cassette at each of said spaced-apart sites.

17. The method of loading wafers as claimed in 16, wherein said determining whether the bottom of the cassette is present at said plurality of spaced-apart sites comprises comparing the loads measured at said sites to one another.

18. The method of loading wafers as claimed in claim 17, wherein the

control signal is issued only if the loads measured at each of said sites are substantially the same.